REMARKS

Claims 29-41, 43-54 and 59-60 are pending in the application. Favorable reconsideration is requested.

At the outset, applicant notes with appreciation that the claim amendments and arguments filed in February 2009 have persuaded the Examiner to withdraw all of the previous prior art rejections of the claims. As noted below, applicant believes that the new rejections should also be withdrawn. In this regard, applicant notes that the European Patent Office has granted a patent for the applicant's invention. See, e.g., EP 1599892 B1. Applicant believes that the same success should follow in this case for at least the following reasons.

The following prior art rejections have now been lodged against the claims:

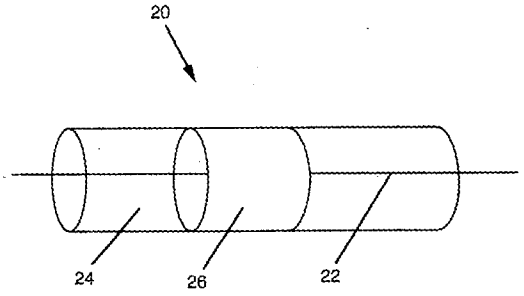
1. Claims 29-41, 43-46, 48-54 and 59-60 stand rejected as allegedly being obvious over Levinson (USP 5152870) in view of Wuest (USP 5416376), Richard (GB 2032173), Munroe (USP 4499398) and Ooms (USP 3956660).
2. Claim 47 stands rejected as allegedly being obvious over Levinson, Wuest, Richard, Munroe and Ooms and further in view of Gee (US Patent Application Publication 20030132705).

As noted below, the rejections are based on some incorrect technical statements. Also, respectfully stated, the rejections are based on hindsight reasoning. Finally, applicant notes that the rejections combine either five (5) or six (6) references. The shear number of references utilized in the Office Action demonstrates that the claimed invention is not obvious. A person skilled in the art would not combine the teachings of the five or six references in any reasonably apparent fashion and arrive at the claimed invention.

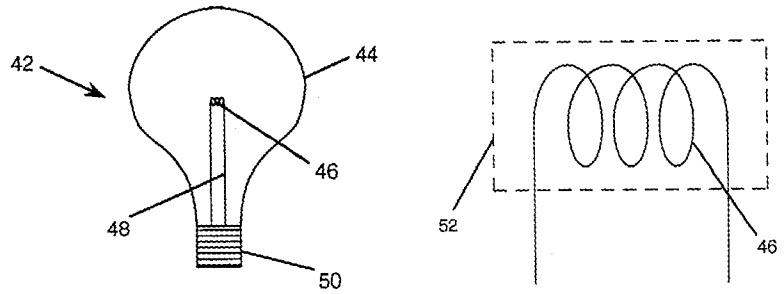
In applicant's prior response (in which all rejections were overcome), Levinson and

Richard were analyzed and shown to be deficient for various reasons. Briefly, Levinson discloses a process for manufacturing filaments for incandescent lamps having an increate radiation efficiency, the process essentially employed for structuring the surface of tungsten filaments (tungsten having a high melting point). Richard discloses an incandescent lamp wherein a filament made of carbon or a refractory metal (i.e., having a high melting point) is embedded within a refractory oxide, in order to suppress evaporation of the material constituting the emitter. Significantly, none of the materials used in Levinson and Richard runs the risk of melting at the operating temperature of the emitter. Thus, these documents are quite different than the claimed invention and its objectives.

The newly cited Wuest reference relates to devices in which a filament 22 is embedded in an aerogel structure 24.



Wuest essentially refers to devices for measuring ionizing radiation, i.e. ionization counters, by detecting the amount of charge liberated by the interaction of ionizing radiation with suitable gases, liquids, or solids. Wuest also mentions the possible use of an aerogel structure 52 for protecting from vibration the filament 46 of an incandescent lamp 42.



The Office Action contends that Wuest would suggest the combined use of tungsten and gold for making incandescence light emitters. The Office Action refers in particular to column 5, lines 10-21 of Wuest, wherein the use is mentioned of a gold-plated tungsten wire. However, this passage in Wuest relates to a part of the disclosure concerning a device for measuring ionizing radiation, i.e., an ionization counter, which has nothing in common with a light source. Also, applicant notes that the introductory part of the disclosure of Wuest makes clear, when explaining the operation and structures of typical ionization counters, that devices of this kind use anode wires made of gold-plated tungsten (see column 1, lines 16-56, in particular lines 48-49).

The part of the Wuest disclosure relating to an incandescent lamp (starting from column 5, line 47) only mentions tungsten as a material for forming the filament (column 6, lines 6-12). Tungsten and tungsten alloys are also mentioned in Wuest's claim 13. Indeed, it is well known by anyone that common incandescent lamps have filaments made of tungsten or tungsten alloys.

In summary, it is immediately apparent from the overall disclosure of Wuest that, in the case of an incandescent lamp, the aerogel structure is combined with a traditional filament – in contrast to the claimed invention. Thus, Wuest teaches away from the claimed invention.

Moreover, it must be noted that aerogels are highly porous structures. See Wuest at

column 2, lines 25-28. For this reason, one skilled in the art would never consider using the aerogoel structure of Wuest with a gold plated filament. Indeed, if the filament 46 of the lamp 42 of Wuest were effectively gold plated, then, at the typical operating temperature of any incandescent lamp, gold would melt and disperse within the pores of the aerogel structure 52. This is further evidence that Wuest teaches away from the claimed invention.

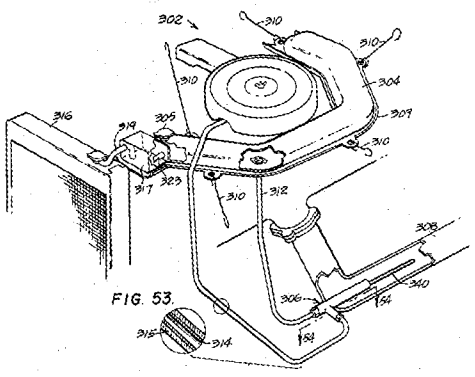
For at least the foregoing reasons, Wuest does not disclose or even remotely suggest the use of a gold plated tungsten filament for a lamp. As mentioned above, such a gold plated filament is disclosed by Wuest only in connection with an ionization counter, which has nothing to do with light emission.

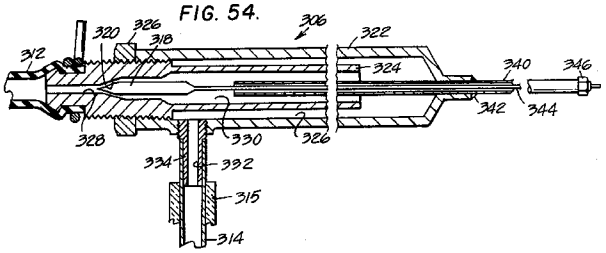
The Office Actions also states that one skilled in the art would be inclined to modify the emitter material, as disclosed by Wuest, in the device of Levinson ***in order to improve corrosion and oxidation resistance of the base element of tungsten*** (page 3 of the Office Action, emphasis added). This motivation is completely erroneous from a technical viewpoint, if one considers that the glass bulb of all incandescent lamp is already filled with an inert gas (such as argon or nitrogen) exactly for the above purpose, i.e., avoiding oxidation and corrosion of the filament (in the past, a void was formed for this purpose in the bulb).

Applicant assumes that the Office Action is possibly basing the above-mentioned motivation (gold plated over tungsten to achieve corrosion resistance in high temperature) on the document mentioned in the section "*Prior Art*" of the Final Office Action, i.e., US 4393817 (Lindberg). If applicant's assumption is right, then the Office Action is comparing different fields that have no real relationships, when considering the involved temperatures. This is evidence of improper hindsight reasoning.

In this regard, Lindberg relates to a combustion and pollution control system for an

internal combustion engine (which has nothing to do with incandescent lamps). One of the embodiments of Lindberg provides for a boiler 306 (Figs. 53-54) installed in the exhaust pipe 308 of the motor, to produce superheated steam starting from water contained in a tank 304, which steam is brought to the motor through a conduit 314.





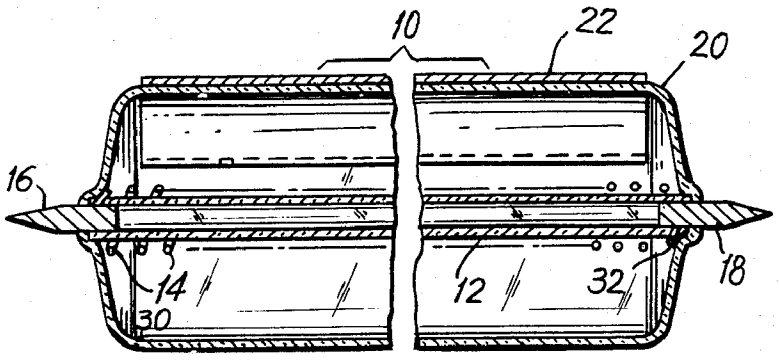
The steam flow is controlled by means of a valve device which is integrated in the boiler 306, this device including a valve element 318 operating at a valve seat 320. The valve element 318 è is actuated through a tungsten wire 344, having a coefficient of thermal expansion lower than the coefficient of thermal expansion of the steel forming a tube 340, within which the tungsten wire 344 is housed and fixed at an end thereof, the steel tube 340 extending within the exhaust pipe 308. It is in this part of the disclosure (column 42, from line 58) that Lindberg states that the tungsten wire 344 can be protected against corrosion by coating it with gold, for instance.

It is more than evident that the temperatures of the water or the steam with which the wire 344 can be in contact is not comparable with the operating temperature (such as 1900-2800K) of a filament for an incandescent lamp as in the applicant's claimed invention. If the temperature

involved in Lindberg were the same as in the subject application, it would be completely useless to coat the wire 344 of Lindberg with gold, simply because the gold coating would melt and thus any protection against corrosion would be lost (gold melts at about 1340K).

In summary, if the Office Action's reasoning concerning Wuest is based on the teaching of Lindberg (that gold plated over tungsten achieves corrosion resistance), then this would be another technical error.

Turning now to the newly cited Munroe reference, Munroe relates to an incandescent lamp having a special structure, distinguished by an inner ceramic support 12 to allow use of a "stronger" filament 14, by a sharp shape of the connection electrodes 16, 18 and by an outer reflecting screen 22.



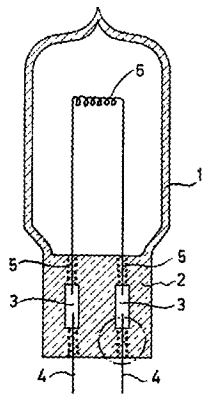
Munroe was cited in the Office Action because it allegedly suggests an incandescence emitter extending between two electrodes.

Applicant's independent claims 29 and 51 require a micro-structure made of a first material (whose melting temperature is lower than the operating temperature of the emitter body) and electrodes made of a second material (having a high melting point). There is no teaching in Munroe (or the other cited documents) of this feature.

Turning to the newly cited Ooms reference, Ooms was cited because, according to the

Office Action, it allegedly suggests to one skilled in the art "*to add the cavity as disclosed by Ooms to at least the emitter body, the electrode or the coating layer ....in order that the melting metal from the emitter material can flow in the cavity* ***at the end of the life of the lamp"*** (page 5 of the Office Action, emphasis added).

Ooms relates to halogen lamps whose bulb has a pinch seal which, according to the introductory part of the disclosure, would be subjected to explosion **at the end of the life of the lamp,** when the filament breaks. In the lamps of the indicated type, the pinch seal includes two molybdenum foils. When the filament breaks, the foils melt and expand in volume, thus causing the bulb explosion (see column 1, lines 15-40).



To overcome this problem, Ooms proposes to provide an "escape path" for the molybdenum, when it melts. In particular, Ooms proposes **providing the pinch seal** with means that form a cavity which adjoins the point of the weld of the molybdenum foils to at least one of the outer conductors of the lamp (see column 1, lines 34-40).

In one embodiment (Figs. 1-2), each conductor 4 of the lamp connected to the molybdenum foil 3 is surrounded by a wire 7 wound in a spiral, being in contact with the foil. In this way, between the conductor 4 and the wire 7, an escape gap is defined, where the

molybdenum can flow. Similarly, in a second embodiment (Fig. 3), the conductor is surrounded by a glass tube 23, performing the functions of the above mentioned wire wound in spiral. In a third embodiment (Figs. 4-5), the outer conductors 16 of a tubular lamp have axial grooves 19, allowing molybdenum to escape.

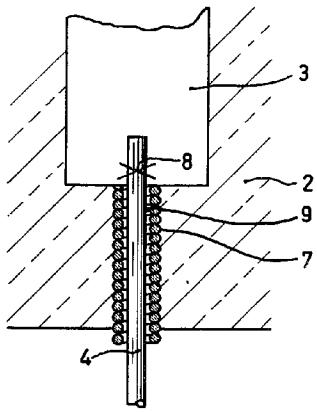


Fig.2

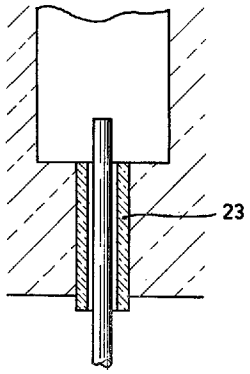


Fig.3

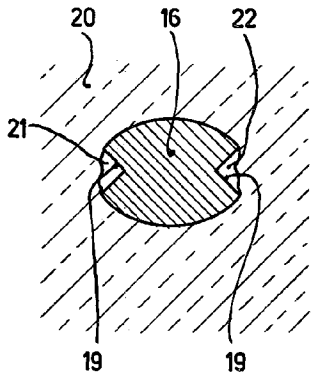


Fig.5

Applicant notes the following significant points.

First, the solution of Ooms is specifically provided for avoiding explosion of the lamp bulb **at the end of the life of the lamp**, i.e., when the filament thereof breaks. This is a first substantial difference with respect to the claimed invention, wherein throats or grooves are provided for assuring correct operation of the lamp at the normal operating temperature of the filament. In the claimed invention, at the normal operating temperature of the filament, the material forming the surface nano-structure changes the state thereof, i.e., it melts, but this does not entail the "death" of the lamp.

Second, the molybdenum foil of Ooms and the "escape means" thereof are specifically integrated within the pinch seal, i.e., a region of the lamp which is spatially separated and spaced apart from the filament, which pinch region is insulated with respect to the inside of the bulb. In contrast, in the applicant's invention, the low melting-point material covers the filament and is directly in contact with the emitter material, the coating layer, and the electrodes.

Significantly, the claimed invention requires that one of the emitter body, the electrodes and the coating layer includes one throat or cavity being open on the nano-structure second material which covers the filament (claim 29) or this throat or cavity is formed in one of the emitter body, the electrodes and the coating layer. This is not the case of Ooms, when considering the embodiments of figures 1-2 and 3, wherein a cavity is formed by a spiral wire or a glass tube extending in the pinch seal. On the other hand, it is immediately apparent that also the embodiment of figures 4 and 5 has nothing to share with the instant invention, i.e., only conductors 16 are provided with grooves, but these conductors extend within the pinch seal region (see figure 4 and the cross section of figure 5).

For at least the foregoing reasons, one skilled in the art would have no real reasonable motivation to combine the five cited references and would never arrive at the claimed invention. Accordingly, applicant requests the withdrawal of the rejection of claims 29-41, 43-46, 48-54 and 59-60.

Claim 47 depends from claim 29; thus, the foregoing arguments apply to the lone rejection of claim 47, and the additional Gee reference does not overcome the deficiencies of the references discussed above.

Applicant submits that the subject application is in condition for allowance and earnestly solicits a notice to that effect.

If the Examiner has any questions concerning this application, the undersigned may be contacted at 703-816-4009.

Respectfully submitted,

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